

HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site: Corozal Well

CERCLIS ID No.: PRN000206452

Date Prepared: September 2011

Contact Persons

Site Investigations: Denise Zeno (212) 637-4319
U.S. Environmental Protection Agency
New York, NY

Documentation Record: Ildefonso Acosta (212) 637-4344
U.S. Environmental Protection Agency
New York, NY

Pathways, Components, or Threats Not Scored

The surface water, soil exposure, and air pathways were not scored because the listing decision is not significantly affected by those pathways. The site score is sufficient to list the site on the ground water pathway score.

This page has been left blank intentionally.

HRS DOCUMENTATION RECORD

Name of Site: Corozal Well

CERCLIS ID No.: PRN000206452 [Ref. 3, p. 1]

EPA Region: 2

Date Prepared: September 2011

Street Address of Site: * [Off of] Carretera 811 Km 3.0 [Ref. 3, p. 1]

County, State, and ZIP Code: Corozal, Puerto Rico 00783 [Ref. 3, p. 1]

General Location in the State: interior, north-central Puerto Rico [Figure 1]

Topographic Map: Corozal, PR [Ref. 4, p. 1]

Latitude: * 18° 17' 44.56" (18.295711°) North Longitude: * 66° 17' 10.34" (-66.286205°) West

[Figure 1; Ref.; 4, p. 1; 5, pp. 1-2]

The site consists of a ground water plume with no identified source(s) of contamination [Figure 1; Ref. 3, p. 1]. The area of observed ground water contamination consists of the Comunidad Santana community supply well, which is the sole source of drinking water for a community of more than 200 people [Figure 1; Ref. 7, pp. 2-18; 11, pp. 58-130; 28, p. 2]. The reference point for the street address and site latitude/longitude coordinates is the Comunidad Santana well [Figure 1; Ref. 1, p. 51595; 5, pp. 1-2]. The Comunidad Santana well does not have a specific street address (i.e., no number), but it is accessible from Carretera 811 (i.e., Route 811); the street address listed here identifies the kilometer marker of the unnamed side road that leads to the well location [Figure 1; Ref. 3, p. 1].

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Scores

Ground Water Pathway	100.00
Surface Water Pathway	Not Scored
Soil Exposure Pathway	Not Scored
Air Pathway	Not Scored

HRS SITE SCORE 50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE
Corozal Well

	<u>S</u>	<u>S²</u>
1. Ground Water Migration Pathway Score (S _{gw}) (from Table 3-1, line 13)	<u>100.00</u>	<u>10,000</u>
2a. Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	<u>Not Scored</u>	
2b. Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	<u>Not Scored</u>	
2c. Surface Water Migration Pathway Score (S _{sw}) Enter the larger of lines 2a and 2b as the pathway score.	<u>Not Scored</u>	
3. Soil Exposure Pathway Score (S _s) (from Table 5-1, line 22)	<u>Not Scored</u>	
4. Air Migration Pathway Score (S _a) (from Table 6-1, line 12)	<u>Not Scored</u>	
5. Total of S _{gw} ² + S _{sw} ² + S _s ² + S _a ²	<u>10,000</u>	
6. HRS Site Score Divide the value on line 5 by 4 and take the square root	<u>50.00</u>	

GROUND WATER MIGRATION PATHWAY SCORESHEET
Corozal Well

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	not scored
2b. Net Precipitation	10	not scored
2c. Depth to Aquifer	5	not scored
2d. Travel Time	35	not scored
2e. Potential to Release [lines 2a(2b+2c+2d)]	500	not scored
3. Likelihood of Release	550	550
Waste Characteristics		
4. Toxicity/Mobility	*	100
5. Hazardous Waste Quantity	*	100
6. Waste Characteristics	100	10
Targets		
7. Nearest Well	50	50
8. Population		
8a. Level I Concentrations	**	2,170
8b. Level II Concentrations	**	0
8c. Potential Contamination	**	not scored
8d. Population (lines 8a+8b+8c)	**	2,170
9. Resources	5	0
10. Wellhead Protection Area	20	0
11. Targets (lines 7+8d+9+10)	**	2,220
12. Aquifer Score (lines 3x6x11 divided by 82,500)	100	100.00
13. Ground Water Migration Pathway Score (Sgw)	100	100.00

* Maximum value applies to waste characteristics category.

** Maximum value not applicable.

REFERENCES

Reference Number	<u>Description of the Reference</u>
1.	U.S. Environmental Protection Agency (EPA). <u>Hazard Ranking System, Final Rule</u> . Federal Register, Volume 55, No. 241, pp. 51532-51667. A complete copy of HRS is available at http://www.epa.gov/superfund/sites/npl/hrsres/index.htm#HRS Rule . December 14, 1990. [138 pages]
2.	EPA. <u>Superfund Chemical Data Matrix, SCDM Data Version: 1/27/2004, Appendices B-I (Hazardous Substance Factor Values) and B-II (Hazardous Substance Benchmarks): excerpts downloaded on April 6, 2011</u> . A complete copy of SCDM is available at http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm . [5 pages]
3.	EPA. <u>Superfund Site Information, Corozal Well, Corozal, Puerto Rico: Site Information and Actions</u> . Downloaded from http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0206452 on March 7, 2011. [2 pages]
4.	U.S. Department of the Interior Geological Survey (USGS). <u>Corozal Quadrangle, Puerto Rico, 7.5-Minute Series (Topographic)</u> . 1972. [1 page]
5.	Gilliland, Gerry, Weston Solutions, Inc., (WESTON). <u>Project Note to Corozal Well HRS Site File, Subject: Latitude and Longitude Determination</u> . March 25, 2011. [3 pages]
6.	Gilliland, Gerry, WESTON. <u>Telecon Note, record of conversations with various employees at PR Department of Health (PRDOH), Subject: Contaminated Well in Corozal/Naranjito</u> . February 9, 2011. [1 page]
7.	Marrero, Marilyn, PRDOH. <u>Transmittal Memo to Ana Mendoza, Subject: Report of Change in Comunidad Santana System (724147); with translation by WESTON attached</u> . February 25, 2008. [18 pages]
8.	Torres, Javier O., PRDOH. <u>Email to Gerry Gilliland, WESTON, Subject: [Attached] Comunidad Santana results</u> . February 10, 2011. [15 pages]
9.	Aviles Santiago, Edward, Environmental Laboratory, Puerto Rico Environmental Quality Board (PREQB). <u>Memorandum to Roberto Ayala Prado, Re: Environmental Emergency Naranjito, Cedro Abajo Community; with translation by WESTON attached</u> . January 31, 2011. [17 pages]
10.	WESTON Removal Support Team 2 (RST 2). <u>Field Logbook, Corozal Well Site</u> . December 2010 – February 2011. [12 pages]
11.	Huertas, Carlos L., WESTON RST 2. <u>Sampling Trip Report – Corozal Well Site, Cedro Abajo Ward, Corozal, Puerto Rico</u> . February 28, 2011. [130 pages]
12.	Zeno, Denise, EPA. <u>Email to Gerald Gilliland, WESTON, Subject: Fw: Attached are the regionally assessed data for the Corozal Well site under the CLP Case # 40904, SDG # B8FT1, B8FT2, B8FW2</u> . February 22, 2011. [13 pages]
13.	Huertas, Carlos L., WESTON RST 2. <u>Email to Gerald Gilliland, WESTON, Subject: Corozal Well – January Sampling Event</u> . February 22, 2011. [46 pages]
14.	Huertas, Carlos L., WESTON RST 2. <u>Email to Gerald Gilliland, WESTON, Subject: Corozal - Samples collected on February Event</u> . February 22, 2011. [36 pages]

REFERENCES (continued)

Reference Number	<u>Description of the Reference</u>
15.	Munch, J.W., ed., EPA National Exposure Research Laboratory. <u>Method 524.2, Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry, Revision 4.1.</u> EPA Office of Research and Development. 1995. [48 pages]
16.	Agency for Toxic Substances & Disease Registry (ATSDR). <u>ATSDR ToxFAQs, Tetrachloroethylene, CAS # 127-18-4.</u> U.S. Department of Health and Human Services. September 1997. [2 pages]
17.	Environmental Data Resources, Inc. (EDR). <u>The EDR Radius Map™ Report with GeoCheck®, Corozal Well, Carretera 811 Km 3.0 Interior, Naranjito, PR 00719, Inquiry Number: 2999081.2s.</u> February 24, 2011. [41 pages]
18.	Puerto Rico Environmental Quality Board (PREQB). <u>Final Wellhead Protection Program.</u> April 1991. [158 pages]
19.	WESTON. <u>Field Logbook with Photo Documentation, Corozal Site Discovery Initiative, WO# 20405.012.013.1296.00.</u> December 6-9, 2010. [21 pages]
20.	Gilliland, Gerald, WESTON. <u>Email Message to Denise Zeno, EPA, Subject: Corozal Well Update.</u> March 20, 2011. [1 page]
21.	Huertas, Carlos, WESTON/SEA Consulting. <u>Email Message with attachment to Gerald Gilliland, WESTON, Subject: Corozal Well- GAC unit data.</u> May 3, 2011. [2 pages]
22.	WESTON. <u>Field Logbooks # 1371-4E-ALNM and 1371-4E-AMNT, with GEOPROBE Soil Boring Logs and Photo Documentation, Corozal Well Site, Corozal/Naranjito, PR.</u> February-March 2011. [88 pages]
23.	Gilliland, Gerald V., WESTON. <u>Sampling Trip Report, Corozal Well Site, Document Control No. 1371-2A-AMJO.</u> April 26, 2011. [27 pages]
24.	Arnone, Russell, EPA. <u>Email with attachments to Denise Zeno, EPA and Gerald Gilliland, WESTON, Subject: Attached are the regionally assessed data for the Corozol [sic] Well site under the CLP Case # 41136, SDG # B94L4.</u> April 28, 2011. [41 pages]
25.	Arnone, Russell, EPA. <u>Email with attachments to Denise Zeno, EPA and Gerald Gilliland, WESTON, Subject: Attached are the regionally assessed data for the Corozol [sic] Well site under the CLP Case # 41136, SDG # B94M0.</u> April 19, 2011. [73 pages]
26.	Arnone, Russell, EPA. <u>Email with attachments forwarded to Gerald Gilliland, WESTON, Subject: Attached are the regionally assessed data for the Corozal Well site under the CLP Case # 41136, SDG # B94G3.</u> April 12, 2011. [62 pages]
27.	Arnone, Russell, EPA. <u>Email with attachments to Denise Zeno, EPA and Gerald Gilliland, WESTON, Subject: Attached are the regionally assessed data for the Corozol [sic] Well site under the CLP Case # 41136, SDG # B94K1, B94H8.</u> May 6, 2011. [112 pages]
28.	Feliciano, Jaime, JFA Geological and Environmental Scientists, P.S.C., and Chris Taylor, GeoView, Inc. <u>Report on Geophysical Well Logging Study, Groundwater Investigation Site, Municipality of Corozal, PR, JFA Job No. 397-11.</u> Prepared for KEMRON Environmental Services, Inc. April 13, 2011. [Excerpt, 16 pages]

REFERENCES (continued)

Reference Number	Description of the Reference
29.	Nelson, Arthur E., USGS. <u>Cretaceous and Tertiary Rocks in the Corozal Quadrangle, Northern Puerto Rico</u> . Geological Survey Bulletin 1244-C. Prepared in cooperation with the Economic Development Administration of Puerto Rico. 1966. [24 pages]
30.	Rodríguez, José M., USGS. <u>Assessment of Ground-Water Withdrawals at Municipal Industrial Parks in Puerto Rico, 2000; excerpts</u> . Scientific Investigation Report 2004-5029. Prepared in cooperation with Puerto Rico Industrial Development Company (PRIDCO). 2004. [30 pages]
31.	Nelson, Arthur E., USGS. <u>Geologic Map of the Corozal Quadrangle, Puerto Rico</u> . Miscellaneous Geologic Investigations Map I-473. Prepared in cooperation with the Economic Development Administration of Puerto Rico. 1967. [1 sheet]
32.	Sumbaly, Smita, WESTON RST 2, Region II. <u>Transmittal Memo to Angel Rodriguez, Caribbean Environmental Protection Branch, EPA Region II, Subject: Corozal Well Site, Data Validation Assessment</u> . May 19, 2011. [65 pages]

SITE SUMMARY

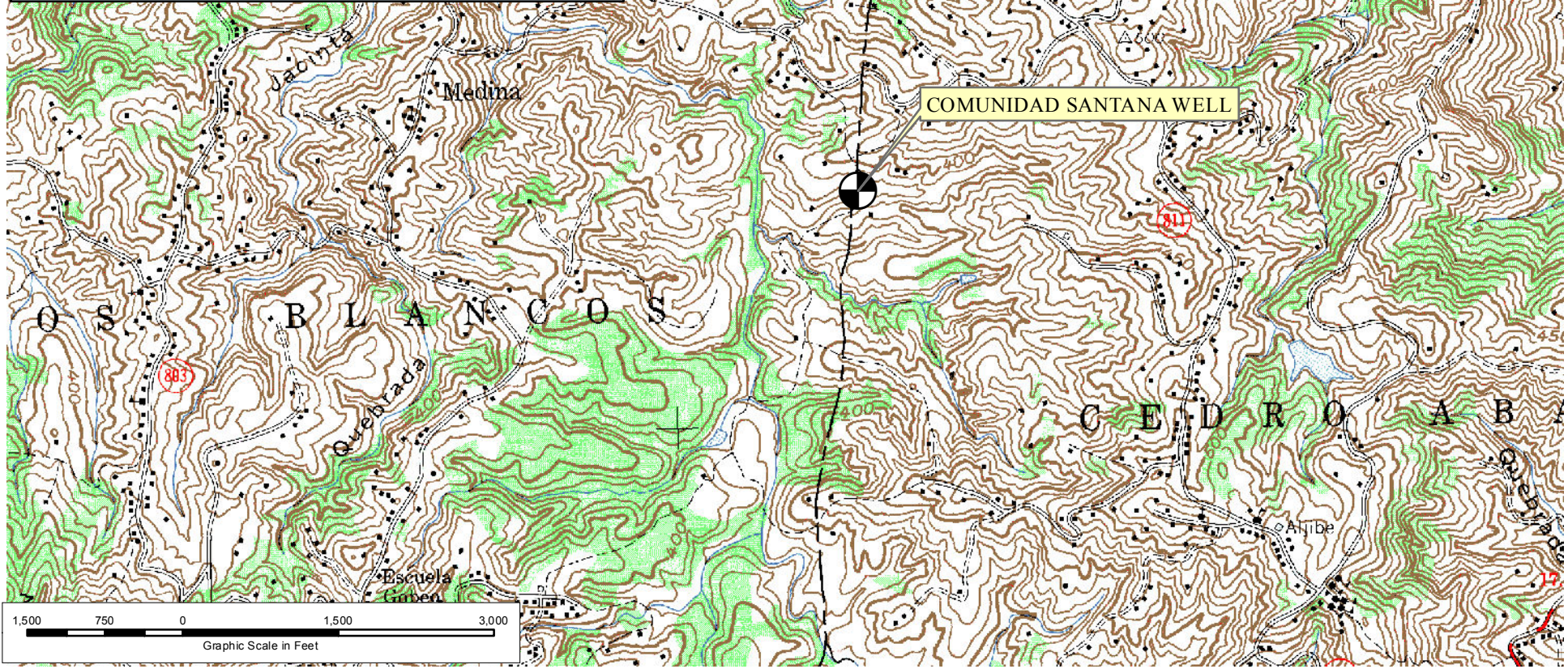
The Corozal Well site (CERCLIS ID No. PRN000206452) consists of a ground water plume with no identified source(s) of contamination, located in Barrio Palos Blancos, Corozal, a rural residential community in interior north-central Puerto Rico [Figure 1; Ref. 3, p. 1; 4, p. 1]. The site straddles the border between the municipalities of Corozal and Naranjito, and the geographic coordinates of the site are 18° 17' 44.56" north latitude and 66° 17' 10.34" west longitude, based on the location of the Comunidad Santana community supply well [Figure 1; Ref. 4, p. 1; 5, pp. 1-2]. A Site Location Map is presented as Figure 1.

The contamination currently affects the Comunidad Santana well, which is the sole source of drinking water for a rural community of more than 200 people (PWSID # PR0724147) [Ref. 6, p. 1; 7, pp. 2-12, 14-18; 11, pp. 6, 11, 58-130]. Ground water contamination in the well was discovered in November 2010, when Puerto Rico Aqueduct and Sewer Authority (PRASA) collected samples from non-PRASA system wells on behalf of Puerto Rico Department of Health (PRDOH) [Ref. 6, p. 1; 8, pp. 1-15]. Samples collected from the Comunidad Santana well on November 12 and 23, 2010 indicated the presence of tetrachloroethylene (PCE) at concentrations of 17 and 92.5 micrograms per liter (µg/L), above the U.S. Environmental Protection Agency (EPA) Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) of 5 µg/L [Ref. 2, p. 5; 8, pp. 8, 12]. Upon discovery and confirmation of the MCL exceedance, PRDOH ordered the well to be closed [Ref. 6, p. 1]. The pump was removed from the well to avoid usage, while PRASA, the National Guard, and subsequently EPA provided an alternate water source for the affected residents [Ref. 19, pp. 7-8, 18-19]. In February-March 2011, EPA installed a granular-activated-carbon (GAC) treatment system at the site, reinstalled the well pump, and began to pump treated well water into the community water supply for distribution [Ref. 20, p. 1; 21, pp. 1-2; 22, p. 8, 19, 22].

Additional ground water samples collected by Puerto Rico Environmental Quality Board (PREQB) and EPA between November 2010 and March 2011 confirm the presence of PCE in the Comunidad Santana well, at concentrations ranging from 39 to 120 µg/L [Ref. 9, pp. 2, 9, 16; 10, pp. 1-6; 11, pp. 2-3, 7, 10, 13-14, 29, 37, 46; 12, pp. 1, 4; 14, pp. 6, 12; 23, pp. 5, 13, 21; 24, pp. 2, 17-18]. Surface water sampling by PREQB and EPA also indicates the presence of PCE in the unnamed creek adjacent to the well, at concentrations ranging from an estimated 0.86 µg/L to 23 µg/L [Ref. 9, pp. 2, 4, 9-10, 16-17; 23, pp. 5-6, 13, 15; 25, pp. 4-10, 16, 33-42, 49-50].

Since discovery of the contamination, EPA and PREQB have attempted to identify the source(s) of observed ground water contamination. Reconnaissance efforts indicate that there are few commercial/industrial operations in the area surrounding the contaminated well, and there is no direct evidence of PCE use at any nearby facilities [Ref. 19, pp. 4-6, 9-10, 14-16, 19; 22, pp. 3-9]. EPA also performed an environmental database search, which did not identify any known possible source facilities within 1 mile of the site [Ref. 17, pp. 1-14]. Aqueous samples collected by PREQB from the two closest known commercial/industrial facilities (RO Rental Equipment, Inc. and ERC Manufacturing) did not indicate the presence of PCE [Ref. 9, pp. 2-3, 13-14, 17; 19, pp. 4-5]. In March 2011, EPA collected soil samples from the same two facilities, as well as a ground water sample from an industrial well at the RO facility [Ref. 22, pp. 21-55, 75-88; 23, pp. 3, 5, 7-9, 13, 21-22, 24, 26]. EPA also collected soil samples from hillsides upstream of the well, including the property of a cabinetmaker [Ref. 22, pp. 13-18, 66-72; 23, pp. 3, 6-7, 13, 17]. The analytical results indicate that PCE is not present in soils upstream of the well, in soils at either of the two industrial facilities, or in the ground water well at the RO facility [Ref. 24, pp. 8, 25-26; 26, pp. 2-20, 24-52; 27, pp. 2-22, 26-63, 70-78, 84-97]. Two other community supply wells located within approximately 0.3 mile of the contaminated well are not yet affected by the PCE contamination [Ref. 23, pp. 3, 5, 13, 21-22; 24, pp. 4-5, 13, 19-22, 31-32]. Based on these considerations, there is not sufficient evidence to attribute the ground water contamination in the Comunidad Santana well specifically to sources at any nearby facilities; therefore, there is no identified source(s) of contamination.

P:\SIT2\Corozal\GIS\MXD\1210_Samp\Ing\hat{a}\09223_Corozal_Sitelocation_v2.mxd



PROJECT:

COROZAL WELL SITE
COROZAL, PUERTO RICO

TITLE:

SITE LOCATION MAP

DATE:

8/17/2011

CLIENT NAME:

USEPA

FIGURE #:

1

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 1

Source Type of the source: Other

Name and description of the source: Corozal Well

Source 1 is considered a contaminated ground water plume of unknown volume without an identified source. The Comunidad Santana community water system (PWSID # PR0724147) consists of a single well that serves a population of 217 people [Ref. 7, pp. 3-4, 14-18; 11, pp. 58-130]. The results for samples collected from the Comunidad Santana well in November 2010 by PRASA on behalf of PRDOH indicated the presence of PCE at concentrations of 17 and 92.5 µg/L [Ref. 6, p. 1; 8, pp. 8, 12]. PRDOH responded to this analytical result by ordering the well to be closed because the PCE concentrations exceeded the MCL of 5 µg/L [Ref. 2, p. 5; 6, p. 1; 8, pp. 8, 12].

Ground water samples collected by EPA from the Comunidad Santana well in December 2010, February 2011 and March 2011 confirmed the presence of PCE in the well, whereas PCE was not detected in several other potable and non-potable wells in the region [Ref. 10, pp. 2-5; 11, pp. 2-3, 7, 10, 13-14, 29, 37, 46; 12, pp. 1, 4; 13, pp. 1, 4, 25-28; 14, pp. 1, 6, 4, 12, 24]. Section 3.1.1 presents the details of the EPA sampling efforts and results.

As discussed in Section 3.1.1, EPA has not yet identified a surface source of the ground water contaminants in the Comunidad Santana well despite extensive discovery, reconnaissance, and sampling efforts.

Location of the source, with reference to a map of the site:

The ground water plume is identified by contamination found in the Comunidad Santana supply well. For the purpose of this report, this well represents a minimum of the plume extent. The well is located in interior, north-central Puerto Rico and is shown in Figure 1.

Containment

Release to ground water:

Based on evidence of hazardous substance migration (contamination detected in ground water samples collected from the Comunidad Santana well) and due to the fact that there is nothing to prevent the plume from migrating further, a containment factor of 10 is assigned [Ref. 1, p. 51596].

2.4.1 Hazardous Substances

Ground water samples collected by PRASA in 2010 and by EPA in 2010 and 2011 showed the presence of chlorinated solvents in the Comunidad Santana community supply well, as described below. Background sample locations and contaminant levels for comparison to the contaminated samples are discussed in Section 3.1.1.

PRASA Sampling (on behalf of PRDOH) – Ground Water Samples: November 2010

PRASA collected ground water samples from the Comunidad Santana well on November 12 and 23, 2010 [Ref. 6, p. 1; 8, pp. 8, 12]. The results are presented in the table below (Note: PRASA reported its results and method detection limits [MDL] in mg/L, which EPA has converted to µg/L for consistency with the EPA data presented in this report) [Ref. 8, pp. 8, 12]. The PRASA samples were collected and analyzed according to EPA Method 524.2 [Ref. 8, pp. 8, 12]. The applicable concentration range of Method 524.2 can be 0.02–200 µg/L or 0.02–20 µg/L [Ref. 15, p. 4]. The method requires a number of quality controls, including demonstrations of capability, accuracy, and precision; analysis of blanks and surrogates; and determinations of MDLs for each analyte [Ref. 15, pp. 16-19]. EPA defines MDL as the “lowest concentration of analyte that a method can detect reliably in either a sample or blank” [Ref. 1, p. 51586]. The PRASA analytical results include MDLs for all parameters [Ref. 8, pp. 1-15].

Hazardous Substance	Sample Number	Date Sampled	Result (µg/L)	MDL (µg/L)	Reference
PCE	1622998	11/12/2010	17.0	0.5	8, p. 12
	1628221	11/23/2010	92.5	5.0	8, p. 8

EPA Sampling Events – Ground Water Samples: December 2010-March 2011

EPA collected ground water samples from the Comunidad Santana well and background ground water samples from nearby wells from December 2010 to March 2011 [Ref. 10, pp. 1-12; 11, pp. 2-3, 7, 10, 13-14, 29, 37, 46, 48; 22, pp. 19-24, 39, 73-74, 79-81; 23, pp. 3, 5, 13, 19, 21-22; 24, pp. 2-8, 13, 17-26, 31-32; 25, pp. 2, 23, 31-32, 59-60]. Samples collected in December 2010, January 2011, and March 2011 were analyzed for TCL VOCs through EPA’s Contract Laboratory Program (CLP) according to Statement of Work SOM01.2, while the February 2011 samples were analyzed outside CLP according to EPA Method 8260B with preparation Method 5030B [Ref. 11, pp. 2-3, 13-14, 29, 37, 46-49; 12, pp. 1-13; 13, pp. 1-46; 14, pp. 1-2, 5-7, 11-13, 17-19, 23-25, 27-35; 23, pp. 3-5, 19, 21-22; 24, pp. 2-8, 13, 17-26, 31-32; 25, pp. 2, 23, 31-32, 59-60]. The CLP results were validated according to SOP HW-33/VOA (Revision 1), the current EPA Region 2 Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data [Ref. 12, pp. 1, 5-13; 13, pp. 42-46; 24, pp. 37-41; 25, pp. 69-73]. PDF printouts of the validated Form I results are presented in the data packages where available [Ref. 13, pp. 2, 25-28; 24, pp. 1, 17-36; 25, pp. 1, 31-32, 59-60]. The February 2011 results were validated according to EPA Region 2 Data Validation SOP No. HW-24 (Revision 2) [Ref. 32, p. 13].

PCE was detected in the Comunidad Santana well samples at individual concentrations ranging from 39 µg/L to 120 µg/L, but was not detected (ND) in background samples from several other wells, as presented in the table below. Additional information regarding background conditions is presented in Section 3.1.1.

Hazardous Substance	Sample Number	Date Sampled	Result (µg/L)	Detection/Quantitation Limit* (µg/L)	Reference
PCE	GW-MW01-050-01	12/16/2010	110	5	10, pp. 2-3; 11, p. 29; 12, pp. 1, 4-13
	GW-MW01-100-01	12/16/2010	120	5	
	GW-MW01-100-02	12/16/2010	120	5	
	GW-MW01-140-001	02/09/2011	63.5	0.3	10, p. 10; 11, p. 46; 14, pp. 6, 12; 32, pp. 1, 12-18, 25, 31
	GW-MW01-140-002	02/09/2011	70.0	0.3	
	1371-GW01	03/29/2011	39	5	23, p. 21; 24, pp. 2, 17-18, 37-41
	GW-MW02-00-001**	01/25/2011	ND	5	10, p. 7; 11, p. 37; 13, pp. 4, 25-28, 42-46
	GW-MW02-00-002**	01/25/2011	ND	5	
	1371-GW02**	03/29/2011	ND	5	23, pp. 21-22; 24, pp. 4, 13, 19-20, 31-32, 37-41
	1371-GW08**	03/29/2011	ND	5	
	1371-GW03**	03/29/2011	ND	5	23, p. 22; 24, pp. 5, 21-22, 37-41
	1371-GW04**	03/29/2011	ND	5	23, p. 22; 24, pp. 7, 23-24, 37-41
	1371-GW05**	03/29/2011	ND	5	23, p. 22; 24, pp. 8, 25-26, 37-41
	1371-GW06**	03/21/2011	ND	5	23, p. 19; 25, pp. 2, 23, 31-32, 59-60, 69-73
	1371-GW07**	03/21/2011	ND	5	

*Available detection/quantitation limits are as follows:

- December 2010, January 2011, and March 2011: RDL/QL or Quantitation Limit [Ref. 12, p. 4; 13, p. 4; 24, pp. 2, 4-5, 7-8, 13; 25, pp. 2, 23]; equivalent to SQL described in the HRS [Ref. 1, p. 51589]
- February 2011: Minimum Detection Limit [Ref. 14, pp. 6, 12, 24]; equivalent to detection limit (DL) described in the HRS for non-CLP sample analyses [Ref. 1, p. 51589]

**Background samples (see Section 3.1.1)

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS) [Ref. 1, pp. 51590-51591].

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored [Ref. 1, p. 51591].

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume

Because there is a well with samples showing contamination in the ground water but the volume of the contaminated area has not been determined, the volume of the ground water contamination is considered to be greater than 0 (>0) cubic yards but unknown [Figure 1; Ref. 12, pp. 1, 4-13; 14, pp. 6, 12; 22, pp. 19-24, 39, 73-74, 79-81; 23, pp. 3, 5, 13, 19, 21-22; 24, pp. 2-8, 13, 17-26, 31-32; 26, pp. 2, 23, 31-32, 59-60]. The source type is 'Other,' so the volume value is divided by 2.5 to obtain the assigned value, as shown below [Ref. 1, p. 51591, Section 2.4.2.1.3, Table 2-5].

Dimension of source (yd^3): $>0 \text{ yd}^3$
Volume (V) Assigned Value: $(>0)/2.5 = >0$

2.4.2.1.4 Area

Tier D is not evaluated for source type "other" [Ref. 1, p. 51591, Table 2-5, Section 2.4.2.1.3].

Area of source (ft^2): N/A
Area (A) Assigned Value: 0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is >0 for Tier C - Volume [Ref. 1, p. 51591].

Source Hazardous Waste Quantity Value: >0

SITE SUMMARY OF SOURCE DESCRIPTIONS

Source Number	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Air (Gas)	Air (Particulate)
1	>0	10	NS	NS	NS

NS = Not Scored

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

The site is located in an area underlain by stratified, highly-fractured bedrock of volcanic origin, specifically the Los Negros Formation of Lower and Upper Cretaceous Age [Ref. 28, pp. 3, 6-9; 29, pp. 6-8, 14-15]. This hydrogeologic unit is considered to be a stratum of limited and local ground water resources in Corozal, but it functions as a local source of water through fractures, joints, faults and the weathered-bedrock mantle [Ref. 30, pp. 12-13, 20-21, 25-27]. A geophysical survey of the Comunidad Santana well and nearby wells showed the presence of numerous, large open fractures and fracture zones within the formation, to depths of almost 500 feet [Ref. 28, pp. 5-9]. The geophysical survey identified a large opening of the borehole wall beneath the casing of the Comunidad Santana well; the geophysical logging suggests that ground water enters the well from a depth of 18 to 23.5 feet in this opening, which might be from borehole washout [Ref. 28, pp. 7-8]. Ground water was encountered within fracture zones, and static water levels ranged from approximately 10 to 40 feet [Ref. 28, p. 5]. The estimated hydraulic conductivity of highly-fractured igneous rocks such as those found at the site is 10^{-2} centimeters per second (cm/s) [Ref. 1, p. 51601].

The depth of the Comunidad Santana well is 159 feet, and the depths of nearby wells range from 298 to 496 feet [Ref. 28, p. 5]. The wells nearby are all located in the same topographic and geologic setting as the Comunidad Santana well (i.e., Los Negros Formation consisting of volcanic rocks located within the mountainous, interior region of Puerto Rico) [Ref. 28, pp. 3, 6-9; 29, pp. 6-8, 14-15; 31, p. 1]. The Comunidad Santana well serves a population of 217 people; there are no other wells or surface water intakes contributing to the system [Ref. 6, p. 1; 7, pp. 2-12, 14-18].

Based on these considerations, Los Negros Formation is evaluated as the aquifer under consideration, and only targets within the immediate site area are included for HRS scoring purposes [Ref. 1, p. 51595]. The aquifer is described in greater detail below:

Stratum 1/Aquifer

Stratum/Aquifer Name: Los Negros Formation

Description: The Los Negros Formation, which trends eastward across the study area, consists predominantly of numerous layers of massive, basaltic tuff and some basalt flow breccia and lapilli tuff [Ref. 29, pp. 8, 14]. The formation is mostly dark-greenish-gray to dark-greenish-black in fresh exposures, and it typically weathers to light-olive-green; globular masses of basalt are randomly scattered throughout the tuff [Ref. 29, p. 14; 31, p. 1]. The Los Negros Formation has a maximum thickness of 1,000 meters (approximately 3,300 feet) [Ref. 31, p. 1].

3.1 LIKELIHOOD OF RELEASE

3.1.1 Observed Release

Aquifer Being Evaluated: Bedrock aquifer (Los Negros Formation)

An observed release is documented for the Corozal Well site. Chemical analyses for ground water samples collected from the Comunidad Santana well in December 2010, February 2011, and March 2011 show the presence of PCE, as shown below.

Direct Observation

The aquifer is not evaluated for observed release by direct observation.

Chemical Analysis

EPA collected three ground water samples from the Comunidad Santana well in December 2010 and February 2011, and the results confirmed the presence of PCE at concentrations ranging from 63.5-120 µg/L [Ref. 10, pp. 2-5; 11, pp. 2-3, 7, 10, 13-14, 29, 37, 46; 12, pp. 1, 4; 14, pp. 1, 6, 12]. Samples collected from background wells showed non-detects for PCE [Ref. 13, pp. 1, 4, 25-28; 14, pp. 1, 4, 24]. Additional samples collected by EPA in March 2011 indicate that the ground water contamination is currently isolated at the Comunidad Santana well, whereas PCE was not detected in several other potable and non-potable wells in the region [Ref. 22, pp. 19-24, 39, 73-74, 79-81; 23, pp. 3, 5, 13, 19, 21-22; 24, pp. 2-8, 13, 17-26, 31-32; 25, pp. 2, 23, 31-32, 59-60]. The location of each well sampled for chemical analysis is depicted on Reference 23, p. 13.

Background Concentrations

Well Location	Elevation (ft AMSL)	Casing Depth (ft bgs)	Well Depth (ft bgs)	Screened* Interval (ft AMSL)	Sample Station ID	Sample Date	Reference(s)
Nieves Sanchez (active)	1,312	22	496	1,290-816	GW-MW02-00-001	01/25/2011	4, p. 1; 10, p. 7; 11, pp. 3, 10, 37; 22, p. 23; 23, pp. 5, 21-22; 28, p. 5
					GW-MW02-00-002	01/25/2011	
					1371-GW02	03/29/2011	
					1371-GW08	03/29/2011	
Well No. 3 (inactive Nieves Sanchez well)	1,330	Unknown	44	1,330-1,286	1371-GW06	03/21/2011	4, p. 1; 22, pp. 19-20; 23, pp. 5, 19
					1371-GW07	03/21/2011	
Sector La Riviera (a.k.a., Don Antonio)	1,240	67.8	298	1,172.2-942	1371-GW03	03/29/2011	4, p. 1; 22, p. 22; 23, pp. 5, 22; 28, p. 5
Up Construction Corp.	1,375	Unknown	Unknown	Unknown	1371-GW04	03/29/2011	4, p. 1; 22, pp. 22-23; 23, pp. 5, 22
RO Rental Equipment, Inc. (a.k.a., Ortega)	1,375	25.2	347	1,349.8-1,028	1371-GW05	03/29/2011	4, p. 1; 22, p. 23; 23, pp. 5, 22; 28, p. 5

ft AMSL = feet above mean sea level

ft bgs = feet below ground surface

* = Screened or open

Background Concentrations (continued)

Sample ID	Hazardous Substance	Conc. (µg/L)	Detection/ Quantitation Limit* (µg/L)	Reference(s)
GW-MW02-00-001	PCE	ND	5	11, p. 37; 13, pp. 4, 25-28, 42-46
GW-MW02-00-002	PCE	ND	5	
1371-GW02	PCE	ND	5	23, pp. 21-22; 24, pp. 4, 13, 19-20, 31-32, 37-41
1371-GW08	PCE	ND	5	
1371-GW06	PCE	ND	5	23, p. 19; 25, pp. 2, 23, 31-32, 59-60, 69-73
1371-GW07	PCE	ND	5	
1371-GW03	PCE	ND	5	23, p. 22; 24, pp. 5, 21-22, 37-41
1371-GW04	PCE	ND	5	23, p. 22; 24, pp. 7, 23-24, 37-41
1371-GW05	PCE	ND	5	23, p. 22; 24, pp. 8, 25-26, 37-41

*Available detection/quantitation limits are as follows:

- December 2010, January 2011, and March 2011: RDL/QL or Quantitation Limit [Ref. 12, p. 4; 13, p. 4; 24, pp. 2, 4-5, 7-8, 13; 25, pp. 2, 23]; equivalent to SQL described in the HRS [Ref. 1, p. 51589]
- February 2011: Minimum Detection Limit [Ref. 14, pp. 6, 12, 24]; equivalent to detection limit (DL) described in the HRS for non-CLP sample analyses [Ref. 1, p. 51589]

Contaminated Samples

Well Location	Elevation (ft AMSL)	Casing Depth (ft bgs)	Well Depth (ft bgs)	Screened* Interval (ft AMSL)	Sample Station ID	Sample Date	Reference(s)
Comunidad Santana	1,215	14.2	159	1,200.8-1,056	1622998	11/12/2010	4, p. 1; 8, pp. 8, 12; 10, pp. 2-3, 10; 11, pp. 3, 10, 29, 46, 51; 23, p. 21; 28, p. 5
					1628221	11/23/2010	
					GW-MW01-050-01	12/16/2010	
					GW-MW01-100-01	12/16/2010	
					GW-MW01-100-02	12/16/2010	
					GW-MW01-140-01	02/09/2011	
					GW-MW01-140-02	02/09/2011	
					1371-GW01	03/29/2011	

ft AMSL = feet above mean sea level

ft bgs = feet below ground surface

* = Screened or open

Contaminated Samples (continued)

Sample ID	Hazardous Substance	Conc. (µg/L)	Detection/ Quantitation Limit* (µg/L)	Reference(s)
1622998	PCE	17.0	0.5	8, pp. 8, 12
1628221	PCE	92.5	5.0	
GW-MW01-050-01	PCE	110	5	11, p. 29; 12, pp. 1, 4-13
GW-MW01-100-01	PCE	120	5	
GW-MW01-100-02	PCE	120	5	
GW-MW01-140-01	PCE	63.5	0.3	11, p 46; 14, pp 6, 12
GW-MW01-140-02	PCE	70.0	0.3	
1371-GW01	PCE	39	5	23, p. 21; 24, pp. 2, 17-18, 37-41

*Available detection/quantitation limits are as follows:

- November 2010: Method Detection Limit [Ref. 8, pp. 8, 12]; equivalent to detection limit (DL) described in the HRS for non-CLP sample analyses [Ref. 1, p. 51589]
- December 2010, January 2011, and March 2011: RDL/QL or Quantitation Limit [Ref. 12, p. 4; 13, p. 4; 24, pp. 2, 4-5, 7-8, 13; 25, pp. 2, 23]; equivalent to SQL described in the HRS [Ref. 1, p. 51589]
- February 2011: Minimum Detection Limit [Ref. 14, pp. 6, 12, 24]; equivalent to DL described in the HRS for non-CLP sample analyses [Ref. 1, p. 51589]

Attribution:

EPA has not yet identified a source of the ground water contaminants in the Comunidad Santana well. PCE does not occur naturally, and non-detect concentrations in nearby wells show that the compound is not ubiquitous in the area (see Section 3.1.1) [Ref. 12, pp. 1-13; 13, pp. 1-46; 14, pp. 1-36; 16, pp. 1-2]. PCE is a man-made chlorinated solvent that is commonly used in commercial/industrial operations such as dry cleaning and metal degreasing [Ref. 16, pp. 1-2].

Since discovery of the contamination, EPA and PREQB have attempted to identify the source(s) of observed ground water contamination. Reconnaissance efforts indicate that there are few commercial/industrial operations in the area surrounding the contaminated well, and there is no direct evidence of PCE use at any nearby facilities [Ref. 19, pp. 4-6, 9-10, 14-16, 19; 22, pp. 3-9]. Aqueous samples collected by PREQB from the two closest known commercial/industrial facilities (ERC Manufacturing [ERC] and RO Rental Equipment, Inc. [RO]) did not indicate the presence of PCE [Ref. 9, pp. 2-3, 13-18; 19, pp. 4-5]. Expanded EPA site discovery, reconnaissance, and sampling efforts (i.e., Expanded Site Inspection [ESI] efforts) from December 2010 to March 2011 did not identify the source(s) of contamination, as described below.

In December 2010 and February 2011, EPA conducted reconnaissance efforts in the vicinity of the Comunidad Santana well to identify possible sources of ground water contamination [Ref. 19, pp. 4-6, 9-10, 14-16, 19; 22, pp. 3-7]. EPA also performed an environmental database search and conducted interviews to document site histories and regulatory status of possible source facilities [Ref. 17, pp. 1-14; 19, pp. 4-9; 22, pp. 3-7]. The environmental database search did not identify any known possible source facilities within 1 mile of the site, but did identify 20 “orphan” sites that could not be mapped due to poor or inadequate address information [Ref. 17, pp. 1-14]. Available address information indicates that these facilities are all located along Roads 152, 159, or 164, none of which are located within 1 mile of the Comunidad Santana well [Figure 1; Ref. 4, p. 1; 17, pp. 7-8, 14]. For instance, the address for Corozal Coin & Dry Cleaners (Road 159 kilometer 13.4) is located on the outskirts of the Corozal Pueblo approximately 4 miles northwest of the well [Ref. 4, p. 1; 17, p. 14].

From March 16-31, 2011, EPA collected a total of 8 ground water samples, 9 surface water samples, and 41 soil samples for VOC analysis from the Corozal Well study area [Ref. 23, pp. 3-13]. Ground water samples were collected from the Comunidad Santana well and nearby potable and non-potable wells, and surface water samples were collected from the unnamed stream that flows past the Comunidad Santana well [Ref. 22, pp. 9-12, 19-24, 39, 61-64, 73-74, 79-81; 23, pp. 3, 5-6, 13, 15, 19, 21-22]. EPA collected 15 surface and subsurface soil samples manually from hillsides upstream of the contaminated well, including the property of a cabinetmaker [Ref. 22, pp. 13-18, 66-72; 23, pp. 3, 6-7, 13, 17]. Due to their upstream location in the same watershed as the contaminated well, the ERC and RO facilities were investigated using direct-push drilling techniques to collect surface and subsurface soil samples; EPA collected 13 direct-push soil samples from the ERC facility and 13 direct-push soil samples from the RO facility, as well as a ground water sample from an industrial well at the RO facility [Ref. 22, pp. 21-55, 75-88; 23, pp. 3, 5, 7-9, 13, 21-22, 24-27]. One ground water sample was additionally collected from the Up Construction Corp. facility well used for truck washing and sanitary purposes [Ref. 19, pp. 9, 19; 22, pp. 7, 22-23; 23, pp. 3-5, 13, 22]. The locations of these soil and ground water samples are presented on Reference 23, p. 13. Additional discussion of these facilities and sampling efforts is provided below.

The analytical results for the March 2011 sampling effort indicate that PCE is present only in the Comunidad Santana well and surface water samples in its immediate vicinity, but not in soils uphill of the well and stream, in soils at either of the two industrial facilities, or in any other ground water wells in the area [Ref. 24, pp. 2-8, 13, 17-26, 31-32; 25, pp. 2-16, 23, 31-50, 59-60; 26, pp. 2-20, 24-53; 27, pp. 2-22, 26-63, 70-78, 84-97]. PCE was not detected in the several other potable and non-potable wells in the region, including two other community drinking water supply wells located within approximately 0.3 mile of the contaminated well [Ref. 23, pp. 3, 5, 13, 21-22; 24, pp. 4-5, 13, 19-22, 31-32]. In summary, the results of the March 2011 EPA sampling efforts indicate that the ground water contamination is currently isolated to contamination at the Comunidad Santana well.

Based on these considerations, there is not sufficient evidence to attribute the ground water contamination in the Comunidad Santana well specifically to sources at any nearby facilities; therefore, there is no identified source(s) of contamination.

The facilities sampled by EPA in March 2011 are described below:

1. ERC Manufacturing

The ERC Manufacturing facility is located approximately 0.47 mile east-southeast of the Comunidad Santana well, and is an HVAC duct manufacturer; it purchases sheet metal and shapes it into HVAC ducts. Company representative stated that they do not use degreasers, and there was no evidence of solvent use during the EPA investigation. There is a septic tank located on the property [Ref. 19, pp. 5, 15; 23, p. 13]. EPA observed good housekeeping and did not see any spills [Ref. 19, pp. 4-5]. On March 29-30, 2011, EPA completed four test boreholes at the ERC facility. Direct-push refusal at the bedrock surface occurred at depths of 19 to 25 feet below ground surface. Ground water was not encountered in any boreholes. EPA collected four surface soil and nine subsurface soil samples for TCL VOC analysis through the EPA Contract Laboratory Program (CLP) [Ref. 22, pp. 30-34, 39-48, 77-78, 82; 23, pp. 1-3, 7-8, 21, 24]. PCE was not detected in any of the samples collected from the ERC Manufacturing facility [Ref. 27, pp. 8-22, 26-37].

2. RO Rental Equipment

Located approximately 0.26 mile east of the Comunidad Santana well, RO Rental Equipment is a construction contractor; it operates and maintains heavy machinery. The company performs truck maintenance and truck washing at this location. There is a septic tank located on the property [Ref. 23, p. 13; 22, pp. 6, 38]. On March 30-31, 2011, EPA completed five test boreholes at the RO facility. Direct-push refusal at the bedrock surface occurred at depths of 6 to 35 feet below ground surface. Ground water was not encountered in any boreholes. EPA collected five surface soil and eight subsurface soil samples for TCL VOC analysis through the EPA CLP [Ref. 22, pp 40, 49-55, 85-88; 23, pp. 1-3, 8-9, 24-27]. PCE was not detected in any of the samples collected from the RO Rental Equipment facility [Ref. 27, pp. 2-8, 38-63, 70-78, 84-97].

3. Up Construction Corp.

The Up Construction Corp. facility is located on Road 811, approximately 0.75 mile north-northeast of the Comunidad Santana well [Ref. 23, p. 13]. The facility consists of offices and equipment storage, and a well that is used for truck washing and sanitary purposes but not for drinking water supply [Ref. 19, pp. 9, 19; 22, pp. 7, 22-23]. On March 29, 2011, EPA collected a groundwater sample from the well for TCL VOC analysis through the EPA CLP [Ref. 22, pp. 22-23; 23, pp. 3-5, 13, 22]. PCE was not detected in the sample collected at the Up Construction Corp. facility [Ref. 24, pp. 7, 23-24].

Hazardous Substances Released:

Tetrachloroethylene (PCE)

CAS No. 000127-18-4

Based on the establishment of an observed release to the Comunidad Santana Well as shown above, a value of 550 is assigned to the ground water observed release factor value [Ref. 1, p. 51595].

Ground Water Observed Release Factor Value: 550 [Ref. 1, p. 51595]

3.2 WASTE CHARACTERISTICS

3.2.1 Toxicity/Mobility

Hazardous Substance	Source Numbers	Toxicity Factor Value	Mobility Factor Value	Toxicity/Mobility	Reference
Tetrachloroethylene	1, OR	100	1.0	100	2, p. 4

OR = Observed Release

3.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity (HWQ) Value (Section 2.4.2.1.5)	Is source hazardous constituent quantity data complete? (yes/no)
1	>0	No
Sum of Values:	1 (rounded to 1 as specified in HRS Section 2.4.2.2)	

The sum corresponds to a hazardous waste quantity factor value of 1 in Table 2-6 of the HRS [Ref. 1, p. 51591]. However, based on the fact that targets are subject to Level I concentrations (see Section 3.3.2.3), and hazardous constituent quantity is not adequately determined, a hazardous waste quantity factor value of 100 is assigned if it is greater than the hazardous waste quantity value from Table 2-6 (i.e., 1) [Ref. 1, pp 51591-51592]. Therefore, a hazardous waste quantity factor value of 100 is assigned for the ground water pathway [Ref. 1, pp 51591-51592].

3.2.3 Waste Characteristics Factor Category Value

PCE corresponds to the toxicity/mobility factor value of 100, as shown previously (see Section 3.2.1).

$$\text{Toxicity/Mobility Factor Value (100)} \times \text{Hazardous Waste Quantity Factor Value (100)}: 1 \times 10^4$$

The product (1×10^4) corresponds to a Waste Characteristics Factor Category Value of 10 in Table 2-7 of the HRS [Ref. 1, p. 51592].

Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 10

3.3 TARGETS

The Comunidad Santana well is the sole source of drinking water for a community and serves a population of more than 200 people; according to available information, there are no other wells or surface water intakes contributing to the Comunidad Santana system [Ref. 6, p. 1; 7, pp. 2-12, 14-18]. The recorded population of 217 people is subject to Level I concentrations, as presented below:

Well	Distance from Source (mi.)*	Population	Level I Conc. (Y/N)**	Level II Conc. (Y/N)**	Potential Contam. (Y/N)	Reference(s)
Comunidad Santana	0.0	217	Y	N	N	11, pp. 58-130

* Distance is measured from the center of the area of observed ground water contamination [Figure 1].

** Maximum Contaminant Level/Maximum Contaminant Level Goal (MCL/MCLG), Reference Dose Screen Concentration (RfD), and Cancer Risk Screen Concentration (CRSC) were used as benchmarks to evaluate the level of contamination [Ref. 1, p. 51593]. Applicable benchmarks for the contaminants detected in the observed release, presented here in µg/L for consistency with reported data, are as follows:

Substance	MCL/MCLG	RfD	CRSC	Reference(s)
PCE	5	360	1.6	2, p. 5

Level I Concentrations

Well	Sample	Substance	Conc. (µg/L)	Benchmark (µg/L)	Reference(s)
Comunidad Santana	1622998	PCE	17.0	1.6 (CRSC)	2, p. 5; 8, pp. 8, 12
	1628221		92.5		
	1371-GW01		39		2, p. 5; 23, p. 21; 24, pp. 2, 17-18

3.3.1 Nearest Well

As identified in Section 3.3, the former Comunidad Santana drinking water well is subject to Level I concentrations. Therefore, a nearest well factor value of 50 is assigned [Ref. 1, pp. 51602-51603].

Nearest Well Factor Value: 50

3.3.2 Population

3.3.2.2 Level I Concentrations

As identified in Section 3.3, the former Comunidad Santana drinking water well is subject to Level I concentrations. The population assigned to the well is also explained in Section 3.3. The population subject to Level I concentrations is multiplied by 10 to calculate the Level I concentrations factor value [Ref. 1, p. 51603, Sec. 3.3.2.2].

Level I Well	Population	Reference(s)
Comunidad Santana	217	11, pp. 58-130

Population Served by Level I Wells: 217 Level I Concentrations Factor Value: 2,170 [Ref. 1, p 515603]

3.3.2.3 Level II Concentrations

The people served by the contaminated drinking water well (Comunidad Santana) are already counted under the Level I concentrations factor. The Level II concentrations factor value is 0 because there are no other points of withdrawal subject to Level II concentrations [Ref. 1, p. 51603].

Level II Well	Population	Reference(s)
N/A	N/A	N/A

Population Served by Level II Wells: 0 Level II Concentrations Factor Value: 0

3.3.2.4 Potential Contamination

Due to the fact that the maximum score of 100.00 for the ground water pathway is achieved, potential contamination was not evaluated.

Potential Contamination Factor Value: 0

3.3.3 **Resources**

There is no documented resource use of ground water at the site [Ref. 7, pp. 1-12, 14-18]. Therefore, a resources factor value of 0 is assigned [Ref. 1, p. 51604].

Resources Factor Value: 0

3.3.4 **Wellhead Protection Area**

There are no designated wellhead protection areas at the site or within the target distance limit [Ref. 18]. Based on this information, a wellhead protection area factor value of 0 is assigned [Ref. 1, p. 51604].

Wellhead Protection Area Factor Value: 0